First Post Launch AIRS Science Team Meeting

18 September 2002

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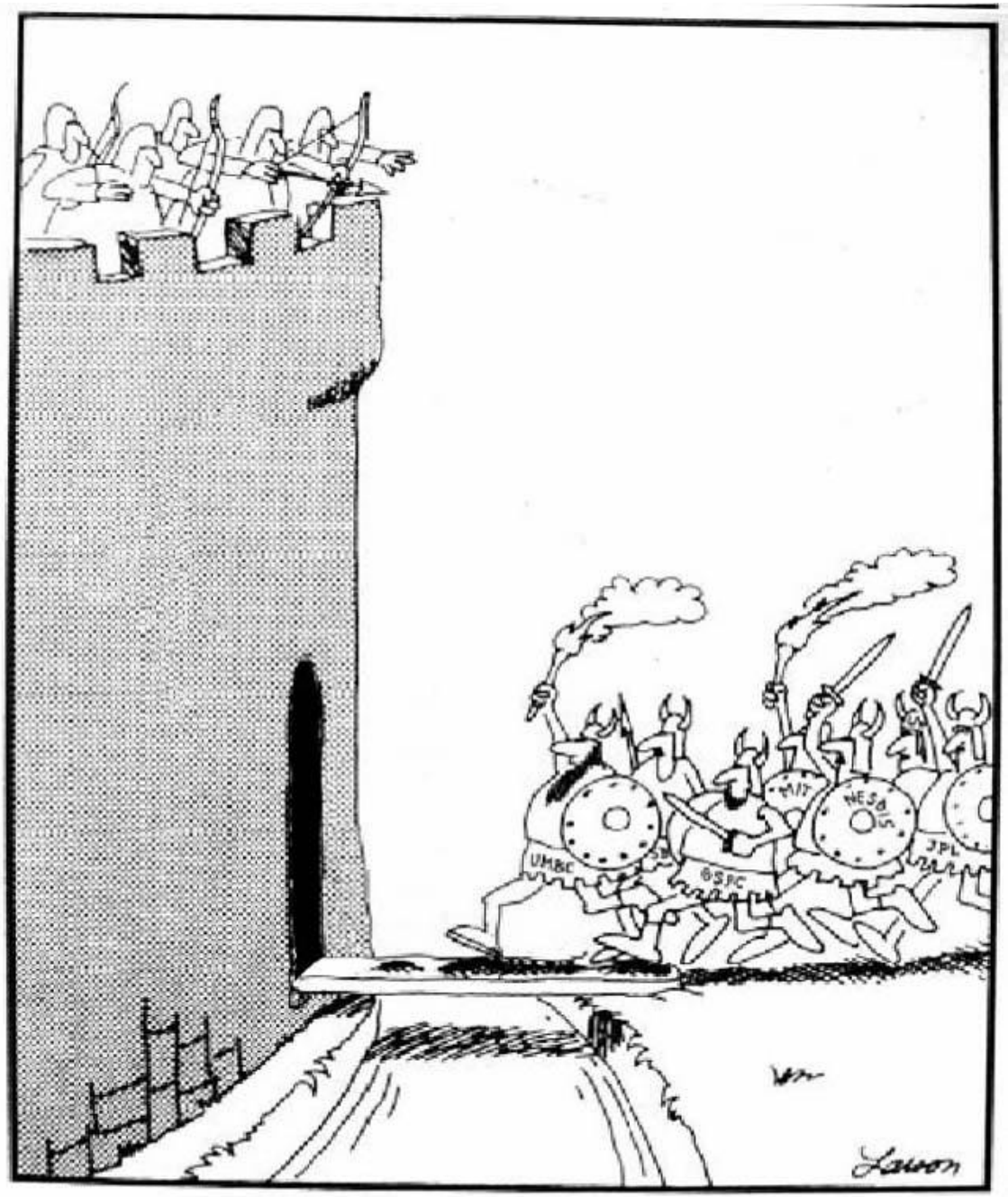

We want AIRS data! We too want AIRS data!

My Topics:

NRA and Science Team Restructure by July 2003
Deliverables at L+7 and L+12 months and Documentation
TGRS Status, Conferences and Publications
Data Decimation
Early Analysis Status
Future Meetings

Documentation

The AIRS Data at the DAAC is much more valuable with proper documentation

L+5 months: Post 20 July 2002 as sample data
Parts of the netmeetings can be used, but not well focussed

L+7 months Level 1b focus delivery of PGE by JPL
Science Team contributes to the User Guide.
Outline to be discussed later

L+12 months Level 2 focus delivery of PGE by JPL
Science Team contributes tasks they signed up for
in the Validation Plan. Fetzer's presentation

ATBD Level 1b and Level 2 update at Launch + 18 months

Open Literature Publications with these reports in mind can serve double duty.

TGRS Status , Conferences, Publications

The AIRS/AMSU/HSB prelaunch papers set the stage for the documentation of the postlaunch performance.

Most of the AIRS/AMSU/HSB papers are have passed the technical reviewer cycle and are now in the final editing phase.

Jim Smith, TGRS Editor, wants to complete the final editing phase by 1 November 2002. The Aqua special issue will then be published early in 2003 (March?)

In order to make the November 1, 2002 goal, the revised papers based on the reviewers comments need to be submitted to the final editing by October 1, 2002.

In order to maximize AIRS/AMSU/HSB data utilization the AIRS Science team is encouraged to give papers at Conferences:

23 September 02 Crete, Greece SPIE Europto: Aumann and Strow et al. (2 papers)
23 October 02 Hangzhou, China (Invited Paper): Pagano/Aumann
December 2002 AGU meeting
9 February 2002 Quebec OSA (Goldberg organizer)
(Special Session AIRS. Looking for 8 good papers)
Could be combined with a team meeting
15 February 2003 Longbeach, AMS. Chahine paper, Tobin poster
April 2003 Orlando SPIE
June 2003 Anchorage: Chahine paper
July 2003 Westcoast SPIE meeting (San Diego?)
July 2003 Toulouse (IGARS)
Could be combined with a team meeting
October 2003 Peking (ITOVS)
Nov 2003 Hawaii (Organized by Asrar)
Could be combined with a team meeting

Data Decimation

AIRS produces a large amount of data:
34 Gbytes/day level 1b
4 Gbytes/day cloud cleared level 1b
1 Gbyte/day retrievals

Data volume OK for process studies using a few granules.
If this data is spooled to tape, it is very slow to retrieve and make
useful for global and climate studies, even with DAAC resource.
Data needs to stay on RAID system.

Data decimation: Not all data is needed by every body all places and all the time.
Create several pre-decimated products at the DAAC.

Pre-decimation: Need to figure out how to pre-decimate level 1b to about
1GByte/day or less as part of the routine DAAC data production
1GByte/day = 400GBytes/year = 3TByte/7 years = local copy is viable.

Several ideas on this topic, also level 3 products.
Science team needs to start thinking about specifics of data utilization
Topic for next science team meeting.

Early IR Radiance (L1b) Evaluation using Earth Scene Data

12 February 2002

George Aumann

1. Radiometric Calibration
2. Scan Angle Effects
3. Spectral Calibration
4. Spatial Calibration
5. Noise Characterization
6. Other Ideas

Outline for the L+7 months L1b focus delivery

1. Radiometric Calibration				
	Evaluate during night time warm ocean using (bt2616 - Reynolds.surface.analysis) all scan angles	Hagan		
	Extremes test. For each channel look at 2% hottest and coldest BT's. Plot trend	McMillin		
	Radiance Covariance test. Verify that expected covariance agrees with observed.	McMillin		
	Reflectivity analysis to find channels effected by sun glint	McMillin		
	Radiance Covariance analysis	Strow		
	Low temperature radiometry verification using AMSU channels	Strow		
	Evaluate calibration artifacts at array boundaries viewing full footprint deep convective clouds	Aumann		
	Broadband radiometry comparisons using GOES imagers	Tobin		
	Eigenvector analysis of observed radiances to assess information content.	Goldberg		

2. Scan angle dependent calibration accuracy				
	Evaluate (bt2616 - surface.analysis) as function of scan angle during night time warm ocean	Hagan		
	Mirror coating test using <210K scenes. Evaluate as function of scan angle.	McMillin		
	Demonstrate that there is less than 0.2K scan angle asymmetry, using upper tropospheric and stratospheric channels.	Aumann		
3. Spectral Calibration Verification				
	Use accurate RTA (correct frequency). Verify the level 1b provided frequency set is appropriate.	Strow		
	Use accurate RTA (correct frequency) with perturbed SRF's to verify that SRF's in orbit are the same as in RTA.	Strow		
	A simple spectral stability evaluation using channels straddling a line. Trend analysis of the difference.	McMillin		
3. Spatial Calibration Verification				
	Verify IR boresight using coastline crossings	Gregorich		

5. Noise evaluation:				
	Verify level1b supplied noise estimates using using the statistics of adjacent footprint differences	Aumann	/hha/index.html	
	Noise evaluation using adjacent footprint difference under extended clear conditions (more than 2 footprints).	McMillin		
	Evaluate noise covariance and radiometric crosstalk.	McMillin		
	NeDT estimation using Earth scene data	Tobin		
	Evaluate noise covariance matrix using (ECMWF.calculated-observed).clear using fast RTA	Susskind		

6. (calc-obs) Bias and stdev evaluation:				
	Evaluate (calculated.ECMWF - observed) for selected clear tropical ocean day and night. Evaluate bias as function of frequency, surface temperature, total moisture and scan angle. Evaluate st.dev relative to level 1b provided noise estimate Use exact RTA.	Strow		
	Evaluate (calculated.NCEP - observed) clear, night for tropical ocean night. Evaluate bias as function of frequency, surface temperature, total moisture and scan angle. Use fast RTA.	JPL		
	Develop simple (physical Pathfinder type) bias equation using (ECMWF.calculated - observed).clear using fast RTA	Susskind		
	Obs-calcs using ARM site and global radiosondes	Tobin		
	Monitor bias between observed radiances and radiances calculated from NCEP and ECMWF fields as a function of scan angle, latitude bands, day/nite, land type, etc.	Goldberg		

7. Other tests:				
	Construct HIRS3 channel radiances from AIRS observations and evaluate using Pathfinder-like retrievals.	Susskind		
	Test clear detection algorithm that has been delivered to JPL (includes predicting 2616 from 8 and 11 micron channels,	Goldberg		
	Attempt first set of AIRS/AMSU retrievals using bias corrected radiances and a channel noise covariance matrix	Susskind		
	Derive first regression coefficients to see if NCEP model profiles can be derived from the radiances.	Goldberg		
	Verify that fixed N2O used for the RTA is appropriate	Strow		
Reference key	ftp://thunder.jpl.nasa.gov/hha/index.html	Aumann		

Why does the AIRS team works on cloud detection?

Identifying cloud-free footprints will be a topic directly or indirectly by all many of the speakers.

Depending on the threshold less than 4%, perhaps less than 1%
of AIRS footprints are cloud free.

AIRS will use cloud clearing to allow utilization of up to 80% of the footprints.

The AIRS team needs reliable clear FOV detection to

1) make sure that the radioemtric calibration and radiative transfer is done correctly, i.e. minimize tuning requirements. High yield is not an issue.
Penalty is high for mixing un-identified clouds into the calibration or radiative transfer.
Critical for climate research.

2) quality control cloud-cleared radiances (they must pass clear FOV test)

The AIRS team requirement for cloud detection is not the same as for clear only retrievals or clear only assimilation. Both have a different tradeoff between cloud-contamination and yield.

Future AIRS Science Team Meetings

18 September 2002 Washington (Today)

15 October 2002 Net

15 November 2002 Net

15 December 2002 Net

7 January 2003 Pasadena (Level 1b focus reports)

(February 2003 Quebec and Long Beach)

15 March 2003 Washington (Validation Reports)

15 April 15 Net

May 2003 Pasadena Launch + 12 months. Final meeting of current AIRS team

July 2003 Toulouse. Meeting of the NRA based AIRS Science team

Nov 2003 Hawaii